

BLINDNESS IN INDIA

**AND THE
POSSIBILITIES OF ITS DIMINUTION**

BY

C. G. HENDERSON

INDIAN CIVIL SERVICE

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SECOND EDITION

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BY

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INDIAN CIVIL SERVICE

WITH A FOREWORD BY

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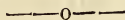
PREFACE

The pamphlet here reprinted was first written in 1917 in England as of possible interest to those concerned with the Blind in that country. But it is thought that it might more suitably be offered to readers in India, and I have therefore presumed to republish it. I have added the text of a lecture on the same subject, and Colonel Elliot has kindly written a Foreword.

1919

C. G. H.

FOREWORD



MR. HENDERSON has asked me to write a foreword to his pamphlet on "Blindness in India". The subject is so immense that whole volumes could be written on it, and yet comparatively little is being done. In the village homes of India lie great masses of helpless humanity, submerged in dark pools of blindness. The pity of it all lies in the fact that so much could be done to rescue these poor people, if their true condition were once realised by their more fortunate fellows. Much of the blindness of India is curable, and even more is preventible. To me it seems that the duty and the privilege of undertaking this work lies with the State, and that no sum spent on such a task could be too large. Unfortunately this is not the view that has been taken by those in authority, and consequently we see the spectacle of private enterprise endeavouring to undertake this colossal task. One looks on with mixed feelings, many of which must be left unexpressed, but it is at least permissible to voice an admiration of the stand Mr. Henderson has taken. His writings on so technical a subject are moderate, well-balanced and erudite far beyond what might have been expected from one who has had no medical training. He never over-states his case. The remedies he proposes recommend themselves at every step, and one's only criticism of them would be that they do not go far enough; simply because the means for going as far he would

wish are not yet to his hand. The best one can hope for his endeavour is that he will succeed in arousing the conscience of educated Indians to the needs of their less fortunate countrymen, and that thus this little cloud, no bigger than a man's hand, will end in a monsoon of active effort, which shall ensure this great problem being faced in a way that it deserves, a consummation far beyond our present prospects or our most fervent anticipations. If Mr. Henderson and his band of workers can rouse the Government of India, and the educated Indians to do their whole duty by the blind in their midst, he will have succeeded where heretofore even a well-organised Medical Profession has failed. In his task he will have the cordial wishes of all those who have given the best years of their lives in the same service.

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Lt.-Col. I.M.S. (*Retired.*)

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BLINDNESS IN INDIA

AND THE

POSSIBILITIES OF ITS DIMINUTION

There are about 600,000 blind persons in India.* This figure relates to the *totally* blind. It does not include people who are going blind or people with some degree of vision, nor those whose defective sight is such that, though not altogether blind, they would, in England, be regarded as fit subjects for a blind school. If all these were included, the number would be vastly increased.

These figures compare unfavourably with those for England and probably most European countries. This is perhaps only what we should expect. What are the conditions under which blindness is prevalent in India (and what is true of India is probably largely true of other tropical or semi-tropical lands with more or less back-ward populations)? I think they may be said to be, in the main, the physical conditions of the country itself, the general backwardness, apathy or ignorance of the population, and the great lack of medical facilities.

In all countries where there is intense sunlight, great heat and much dust, a high incidence of blindness will probably be found, unless the population is sufficiently advanced and intelligent to take the necessary precautions. Witness Syria and Egypt, where the extent of blindness is enormous, and some of the Balkan territories with their intense heat in summer and a dust-laden atmosphere. In India itself, the dry, hot areas like Sind are much worse in the matter of blindness than the comparatively cool, damp and greener tracts like the Konkan. In districts where low stony hills are a feature, and the glare is intense, the eye affection known as pterygium is extremely common.

*But v. Note p. 46.

It goes almost without saying, that the backwardness, apathy and ignorance of the population is one of the causes of the existence of the evil. It is in fact the main cause. For blindness is, for the most part, a preventible affliction, and where the people are sufficiently educated to take the simplest precautions and to avail themselves of medical advice and assistance, even when this involves some trouble and a little expense, the incidence of blindness is likely to be little, if at all, higher than in a country like England. Blindness amongst Europeans in India and amongst the intelligent and educated Parsees is extremely rare.

It is not necessary to labour the great need of medical facilities in India. The late Viceroy, Lord Hardinge, said last year, "I remember how many millions in India are beyond the reach of the medical aid provided by the Government." In an ordinary district the provision would roughly be: one dispensary in charge of a not very highly qualified medical man, called a sub-assistant Surgeon, for each taluka—an area about the size of a small English county, and one District Hospital for the whole district consisting of eight or ten such talukas. There are also a few qualified private medical practitioners in the larger towns. The country is badly supplied with metalled roads, and during the rainy season many villages are practically cut off from the towns, for many of the roads are mere cart-tracks and they are impassable for wheeled traffic owing to the mud.

The Indian peasant, like others who may claim to be more advanced, fails to realise the danger of eye complaints which may, if neglected, lead to blindness. Even where medical facilities are near at hand he, as well as his fellow townsman, will often fail to avail himself of them. and when, for a complaint which he may regard as trivial, he has to travel many miles and attend regularly at a distant dispensary, it is not a matter for much surprise that he remains in his village and suffers the consequences of his neglect. This is not to say that Government hospitals and dispensaries

are not often popular and well attended by patients for various complaints, but for eye diseases, the numbers who will attend constantly and regularly are small compared with the frequency of these complaints. The Indian public would like medical facilities to be brought almost to their very doors and many an eye is destroyed by the travelling quack who visits the villages and persuades his patients to submit to his unskilled operations.

Under the conditions I have attempted to describe, it is perhaps not surprising that we find that most of the blindness which prevails is preventible blindness, but is unfortunately not prevented, and secondly that a great deal of the existing blindness is actually remediable but that no remedy is applied. There are thousands of totally blind persons in India who could obtain some measure of sight if they would submit to a surgical operation. But either they do not know this, or they consider the trouble or expense too great; or they are too apathetic to care much, and it is not only that adults are apathetic for themselves but too often parents are apathetic in regard to their unfortunate blind children.

I have had some personal experience in this matter. In two districts in the Bombay Presidency, I have had prepared by the headman in every village which I proposed to visit, lists of blind persons and persons suffering from any kind of eye disease. These people have been assembled on my visit to the villages and personally examined by me. They fall into three classes, the totally blind for whom nothing can be done; the totally blind to whom an operation would give some sight, or the partially blind whose sight could be improved by an operation or other medical treatment; and those who are suffering from diseases which if not treated will end in loss of sight or great impairment of vision. With the exception of the hopelessly blind for whom nothing could be done, or the very aged, these persons have in large numbers been sent to the most suitable dispensary or hospital for the necessary treatment. This was a big task but with the help of the

influence of the village headmen, and sometimes other officials, it was done. I have with me lists of all these persons with a record of their attendances. The numbers run into thousands. It is impossible to print the lists here, but they are open to inspection by anyone who is sufficiently interested to care to see them. Many have attended till a cure has been recorded though many others have not done so, and owing to their great number it was impossible to keep a control over all of them, but special care was always taken to provide for the regular attendance of the most serious cases. Most of this part of the work (*i. e.*, concerning those cases in which medicinal treatment only, and not operations, were required) is of a preventive nature, dealing, as it does, not with blind persons but with those who have contracted eye complaints which may lead to serious results, if not treated. It is therefore impossible estimate the actual results of such work.

But I now come to the portion of the work for which it is in some degree possible to estimate actual results, that is to say those cases in which an operation was called for and has been performed. In the appendix I give a list of these cases. They are 145 in number. They are mostly of three kinds: (1) persons blind or nearly blind from cataract, including juvenile cataracts. In these cases operations have been performed and, it is gratifying to note, in most cases with success so that the patients have received their sight. (2) Persons, blind from other causes, for whom the operation called iridectomy has been possible, with the results shown in the lists. (3) Persons suffering from entropium, and therefore in grave danger of losing their sight; for whom the necessary operation has been performed and the loss of sight, it is hoped, prevented.*

I will exclude from consideration, at east for the present, the third kind of cases, viz., the entropium cases, for this reason, that in the census statistics 'blind' means 'totally blind,' and persons suffering from entropium are not necessarily blind, though they

*A small fourth class might be added of pterygium cases.

are in danger of losing their sight, and therefore these entropion cases would not be included in the category of blind persons in the Census returns. Now for the districts in which I have worked, the last Census of 1911 shows that there are about 2,000 totally blind persons per million of the population. The areas shown in the appendix have a population of roughly a million between them, and therefore there should be in those areas about 2,000 totally blind persons. If my list is examined, it will be found that there are of the first two kinds of cases mentioned in the previous paragraph (viz., cataract and iridectomy cases) about seventy. In other words, out of about 2,000 totally blind persons in the areas referred to in the appendix, about seventy, or $3\frac{1}{2}$ per cent., obtained more or less vision as the result of operations. But I must add that the means at my disposal for finding out blind cases were of course not perfect, and it is highly probable that a certain number escaped inspection, and further there are always a certain number of cases whom no amount of persuasion will induce to attend hospitals. I do not think it would be extravagant to assume that if all such persons could have been included, at least another thirty cases, in the population of a million, would have been added to the list. If this is so, the figure of remediable cases of total blindness would be five instead of three and a half per cent. Nor is this all. It will be observed that in my list there are very few cases over the age of 50, whereas it is of course true that a large number of the totally blind in India are cases of senile cataracts in aged people. In the areas dealt with there must have been hundreds of those senile cataracts, and in most cases senile cataract is remediable by operation. But with the time and means at my disposal it was impossible to deal with all these older people, and it was my general practice to confine attention mainly to the younger generation, or at least to those under the age of 50. These old people were seen and advised, and given letters to the medical officers in charge of dispensaries or hospitals, but generally these people will not attend without some further inducement or pressure. I have no means of estimating

the total number of these senile cataracts, and consequently the total percentage of remediable cases of total blindness, if all these old people are included. But the figure of roughly five per cent. given above for remediable cases of total blindness in persons under the age of 50, may, I think, be accepted without very much doubt.

Let us consider for a minute what this means. It is true that my investigations concern only a few areas with a total population of about a million, but if the same state of affairs prevails over the rest of India, (and I have no particular reason for believing that it is widely different over most of the country), then we shall have to conclude that out of India's six hundred thousand totally blind, some thirty thousand could be given more or less vision could they be sought out and brought to take advantage of medical facilities. And these persons are children and adults up to the age of 50. This is an estimate based on a few sample areas. It is subject to correction with more experience, and may be modified subsequently one way or the other—that is to say the figures may be too high or, on the other hand, they may be too low. But the estimate may perhaps for the present be accepted at least as an indication of what we may expect. Thirty thousand blind children and men and women, none of them much past the prime of life—about as many as all the blind in the United Kingdom! What would we do to give sight to all the blind in the United Kingdom? But they are there—in India, in a part of the British Empire—thirty thousand blind persons to whom some sight could be given, were there the organisation and the will to help them. And not now only but from generation to generation, for the figures of blindness vary but little from Census to Census.

And let it be remembered that this does not include the many thousands who are only partially blind but whose sight could be much improved by proper medical treatment, and it does not include large numbers of old people.

I should perhaps explain that I am dealing here with people who would of themselves, in all probability, never

take advantage of the medical facilities that exist. Of course numbers of blind do of their own accord attend hospitals and undergo operations. But I have carefully excluded all such cases from the list in the appendix, which represents mainly those of the poorer and more ignorant classes who would never have been likely, but for a certain amount of friendly pressure and occasional pecuniary assistance, to betake themselves to hospitals or qualified medical men. The figure of 5 per cent of cases of remedial blindness, given above, must be taken to refer only to such people and not to include the more intelligent and enterprising who need no pressing to seek medical advice.

This problem of large numbers of totally blind persons who could attain some measure of vision but nevertheless remain in their blindness, is one, it seems, that would repay great efforts to solve. For here is a terrible amount of unnecessary human suffering. But great as this question is, there is a still greater one behind it. I refer to the question of preventible blindness. For blindness is, to the extent probably of 90 per cent. of it, a preventible affliction. If there are some thirty thousand totally blind persons whose blindness could be alleviated, there are some five hundred thousand who, under proper conditions, need never have been blind at all. Apart from cataract, the chief specific causes of blindness in India are: small-pox; eye diseases like conjunctivitis, trachoma, pannus, keratitis, etc.; and ophthalmia neonatorum. Small-pox is a preventible disease, and even if it is contracted and the eyesight is threatened, loss of sight is preventible by medical treatment. Conjunctivitis, trachoma, pannus and keratitis can all be overcome by continued proper treatment, and if so treated need never result in blindness. Ophthalmia neonatorum, the purulent conjunctivitis which attacks children at birth or shortly after, and so often results in total blindness, can be conquered if proper medical treatment is taken in time.

In regard to ophthalmia neonatorum, I may mention that an attempt has already been made, on a small scale, to cope with the evil, in the City of Surat, which has a popula-

tion of about 114,000. A fund of about Rs. 3,000 (£200) was raised by me for this purpose. In India we have no Notification of Births Act, no Children's Act and no Act to make ophthalmia neonatorum compulsorily notifiable. In Municipal areas births have to be registered, generally within 72 hours according to the Bye-laws, but the municipal authorities are often content if a birth is registered within a week, or even if it is registered at all, and prosecutions for failure to conform to the bye-laws about the registration of births are extremely rare, simply because the authorities do not care to enforce the regulations. It is obvious that, under these conditions, no reliance could be placed, in a campaign against ophthalmia neonatorum, on the Municipal machinery of birth registration, because the registration is very defective and reports of births often come in too late for medical assistance to be of use in cases ophthalmia neonatorum, a disease which generally does its destructive work within a few days of the child's birth. Methods employed in England had therefore to be modified in some degree. There is in India a class called *dais*, who are unqualified native midwives, entirely without education, dirty in their habits and primitive in their ideas. But 90 per cent. of maternity cases are attended by these women. A movement has been on foot for the last few years in some of the large cities, which attempts to supervise these women, teach them something and improve their methods. There is as yet no Act for the registration and control of midwives, as in England. In the City of Surat, the Municipal Health Officer, Dr. Pinto, has these women under some sort of control, holds regular classes for them and attempts to instil some idea of cleanliness into their practice. The method we adopted for dealing with ophthalmia neonatorum was as follows. A reward of one rupee was offered to any *dai* who would report a case of ophthalmia to the Health Officer. These women generally visit their cases for about ten days after child-birth, and so they are in a good position to detect any sign of inflammation of the eyes. The ophthalmia had to be reported at once, otherwise the reward was to be reduced. A special Medical Officer (a Sub-assistant Surgeon) was appointed, whose duty

is to attend to all cases of ophthalmia neonatorum reported by the *dais*. In this way it is hoped that most cases will be reported and treated in time to save the eyesight*. This is the scheme which has been recently started within the last few months and is now in operation. It is a very cheap scheme, and the total cost is not likely to exceed £100 per annum, about one-fifth of a penny per head of population. Indeed I anticipate that the cost will be considerably less. The pay and bicycle allowance of the Sub-Assistant Surgeon comes to £44 a year, and beyond that and perhaps £10 or so for rewards to *dais*, there will not be much expense. I am unable to give any results as the scheme has only just now been started. It is a trial scheme—something of an experiment. If it succeeds it will be a cheap method of combating ophthalmia neonatorum.

But ophthalmia neonatorum works its havoc not only in Municipal areas but in villages, difficult to reach by these methods, and the disease itself is but one of the potent causes of blindness. In dealing with ophthalmia neonatorum in cities we touch only a portion of our great problem. That problem is that in every generation (for as I said above the figures of total blindness vary but little from Census to Census) half a million people or more in India are going blind, though their blindness is humanly preventible.

This is a question which, it would seem, should engage humanity's serious thought and endeavour. For India is by no means the only sufferer, but throughout the world and more especially in Oriental or tropical or semi-tropical lands, there must be millions upon millions who go blind when a little timely medical aid would save them from one of the direst of calamities. Apart from the campaigns that have of late years been started in civilised countries against ophthalmia neonatorum, in one country at least a serious attempt appears to have been made to cope with this great

* Certain returns are being maintained, and some statistics as to the incidence, &c., of ophthalmia neonatorum should be available later.:

problem. This is in Russia, and the organisation concerned is known as the "Empress Marie Alexandrovna Society for the Welfare of the Blind." This Association appears to have been founded in 1881, and at the head of it the Empress placed M. Constantine Grot, the Secretary of State (up to 1897) who displayed the greatest activity and enthusiasm in the cause of the blind. See a paper entitled "Work for the Blind in Russia", read before the International Conference for the Blind, in 1914, by H. Jacob Kolonovsky, the Director of the Empress Marie Alexandrovna Society of Petrograd (printed in the Report of the International Conference published by Messrs. Bradbury, Agnew & Co.). The author of this paper writes:—

"The various activities of M. Grot could only awaken the interest and sympathy of society. But he went further; he considered it not enough to help the blind, he decided to diminish the number of blind by preventing blindness. After some weak and indecisive endeavours, M. Grot projected a definite scheme of fighting eye diseases. At this time the activity of the ophthalmic staffs, which aroused the interest of the intellectual classes, began, and the number of oculists largely increased. Besides the annual expedition of staffs, the association established ophthalmic hospitals and stations. M. Grot aspired to create for this branch of activity a special society, but circumstances changed, and the work remained in the hands of the association. Every year the oculists of the staffs, ophthalmic hospitals and stations receive nearly 300,000 patients, who pay more than 1,200,000 visits, and the number of operations performed is nearly 70,000. At present the association sends out twenty-five staffs and possesses twenty-four ophthalmic hospitals and stations."

Unfortunately the paper stops short of giving us details of the work and its results, but at least we see that the importance of the question of preventing blindness has received recognition in Russia, a country with some 250,000 blind, and that a serious attempt is being made to solve it.

And this attempt appears to be based on the realisation of the fact that the problem of the prevention of blindness is largely one of the provision of timely medical help.

So much for Russia ; but what of India, which in population is two-thirds of our Empire and one-fifth of all the world ? Is it impossible to devise means to give sight to some of the thirty thousand totally blind whose blindness is in greater or less measure remediable, and to rescue some at least of the half million who every generation go blind from causes that are preventible ? Would it be possible to found some agency or institution, with adequate funds, to work in this field ? This is perhaps not the place to elaborate a scheme, as considerations of space would probably forbid, though with some experience of the conditions I have for some time past had under consideration measures which might be found workable in attacking the problem. But at present there are no funds, and unless interest is aroused in the question, it is useless to go into details here. But I conceive that the broad lines on which the work might be attempted are something as follows:—

1. Carrying on campaigns against ophthalmia neonatorum in cities, in collaboration with Municipal Authorities, and attempting to extend this preventive work to villages and small towns. Even if confined to cities, this work would be one of the greatest importance.

2. Finding out the blind, and attempting to bring the benefits of modern surgery to them, whenever required. In part, at least, this might be done by travelling ophthalmic Surgeons, by pecuniary assistance to the poorer sufferers to enable them to attend hospitals, etc.

3. Keeping in constant touch with sufferers from various kinds of eye complaints and getting them treated through village medical agencies, which would have to be established. I imagine that work of this kind would be very fruitful in its preventive effects.

4. Establishing ophthalmic hospitals and dispensaries, by preference the latter, for it is probable that, for the

same expenditure, a number of small institutions would be more effective than a few large ones.

There is a saying that you never know what you can do till you try. Here is practically untried ground ; any effort that is made must necessarily at first be of the nature of an experiment—must feel its way until it finds its feet, grows strong and can advance and spread with confidence.

I have written of India—for it is there that my experience has been, little enough though it is. But the question is of world-wide importance and has, it seems, received hitherto too little notice from workers for the blind and others.

Perhaps a little nearer to us, in these days, is this matter of blindness than it was wont to be some years ago, now that in all the countries at war we have seen so many men return with sight destroyed, now that through the fate of their dearest thousands have tasted of the knowledge of what it is to be blind. And those who know—what would they not do, what are they not doing, to alleviate the bitterness of that affliction in the men who have fought for their country? May one not crave, too, some thought for the hundreds of thousands, though they be less near and their appeal less intimate, in our own Empire and indeed in lands throughout the world some effort to heal and, above all, to rescue?

C. G. HENDERSON.

62, West Hill,

St. Leonards-on-Sea.

January 1917,

APPENDIX

Note.—*These lists include, for the most part, only those cases in which OPERATIONS were performed. They do not include, with a few exceptions, the large number of cases treated with medicines only.*

Bulsar, Chikhli, Pardi, Talukas of the Surat District.

Bhanio Kalio of Vasan in the Bulsar taluka Age about 20 or 25. This man had cataracts of long standing (probably congenital cataract) in both eyes with no sight. Was sent to Dr. Pardivala of Bulsar, where the needling operation was performed on 9th June 1915. The result was good. A second needling was done on 17th July. Vision was then quite good. I saw him in March 1916, and he had good sight. To still further improve the vision a third needling was done on 2nd March 1916.

Jogio Morio Nathio of Maliadra in Chikhli taluka A child of three with juvenile cataracts, apparently congenital. No sight. Was sent to Dr. Pardivala of Bulsar. The first needling was done on 10th June 1915, and a second needling on 26th September 1915. I saw him in February 1916, when he had fair vision, and the father was advised to take him to Dr. Pardivala for a third needling.

Namlo Sankro of Pipalgabhan in the Chikhli taluka. Age about 40. His right eye was lost. In the left he had mature cataract. No sight. Was sent to Dr. Pardivala of Bulsar, and operated on for cataract on 16th September 1915. Good result. I saw him again in February 1916, and his sight was then good.

Manchi Lalio Ratna of Bamanvel in the Chikhli taluka. A girl of about 9. Congenital cataracts in both eyes. Sight practically nill. Was sent to Dr. Pardivala of Bulsar. First needling was done on 14th May 1915 the second in June 1915

and a third on 14th September 1915. Result good. I saw her again in February 1916 Sight in right eye was excellent; (with complete absorption); in the left was apparently less good. Father was advised to take her for a fourth needling.

Kesri, wife of Ravio Nathio of Sadakpur in Chikhli taluka A woman of 35 or 40. She had cataracts mature in both eyes. No sight. Was sent to the Municipal dispensary at Bulsar, and operated on for cataract in one eye on 13th May 1915. Result good. She was subsequently sent to Dr. Pardivala of Bulsar, where she was operated on for cataract in the other eye on 16th September 1915. I saw her again in February 1916, when she had good sight in both eyes.

Katiya Kara Isap of Maneckpur in Chikhli taluka. A girl of about 12. She had granular lids, ulcers and opacities. Her left eye was hopeless, with no sight. In the right there was a little vision. With great difficulty she was induced to take treatment at the Municipal dispensary at Bulsar, but did not attend regularly. Again was sent to Dr. Pardivala of Bulsar, but did not attend regularly. She was at last induced to go to Chikhli dispensary, where she attended more or less regularly for a year or so. Her left eye was hopeless, but the right eye was improved, and was saved from further degeneration.

Dalya Banja Dhoria of Ranverikala in Chikhli taluka. He had cataracts in both eyes, apparently congenital. Age about 30. No sight. Was sent to Dr. Pardivala at Bulsar. First needling was done on 25th May 1915, and a second on 15th September 1915. I saw him again in February in 1916. He had slight sight in left, but apparently none in the right. The case was altogether not a very successful one, though he had a little sight in left eye.

Gangli Punio Dhorio of Khergam in Chikhli taluka. A woman about 40. She had cataracts mature in both eyes. No sight. Was sent to the Municipal dispensary at Bulsar, where she was operated on for cataract successfully. I saw her in February 1916, and she then had good vision.

Devlo Durbho of Pipalgabham in Chikhli taluka. Age about 55. Cataracts mature in both eyes. No sight. Was sent to Dr. Pardivala of Bulsar, who operated on one eye by intracapsular method (Smith's operation) Result very good I saw him again in February 1916, when he had good sight, and was advised to go again for the other eye.

Daji Dullabh of Gandeve in Chikhli taluka. Age 7. He had juvenile cataracts in both eyes. No sight. Also appeared somewhat mentally defective. Was sent to Dr. Pardivala at Bulsar. First needling operation was done on 17th May 1915; the second on 3rd June 1915; and the third in September 1915 The result was fairly satisfactory. I saw him in February 1916, and he had fair vision, and his intelligence seemed much improved. The father was advised to take him for a fourth needling.

Ramkor Vithal of Bulsar. Age 2. Congenital cataracts in both eyes No sight. Was sent to Dr. Pardivala and twice needled. Got some sight, but further needling was required.

Chibo Parag of Waghrech in Bulsar taluka. Age 40. Cataracts both mature. No vision. Was sent to Municipal dispensary at Bulsar, where he was operated on for cataracts in both eyes One eye was a failure, but in the other he got good vision.

Bawlo Panchio Dhed of Navera in Bulsar taluka. Age about 10 or 12. This boy was almost blind He had congenital cataracts at birth or soon after, and when a baby, had been operated on for these cataracts in Bombay. The capsules could still be seen, but the absorptiou was practically complete, and the operation had been successfully done. In spite of this, however, there was very little sight, owing probably to some fundus trouble. He could just make out objects close to him, and cloud just make his way about. The boy was sent to Dr. Pardivala in May 1915. He was put on the potassium iodide; strychnine treatment. This was kept up for about four months, without result He was then sent to Dr. Chipkar of Parekh Dispensary, Surat. Dr.

Chipkar tried saline injections and also mercury injections. But there was no result. As improvement seemed to be hopeless, tho boy was sent to an industrial school in Bombay, where he is doing well. (When in Bombay he was sent to the C. J. Eye Hospital, where his eyes were declared hopeless)

Dullabh Uka Suthar of Gandeva in Chikhli taluka. Age about 40. Cataracts both mature. No sight. Was sent to Dr. Pardivala at Bulsar, where he was operated on for cataract on 17th May 1915. As a result he got good vision in the left eye, though the right was less successful. I saw him in February 1916, when he had good sight in the left.

Ganga Dano Ramaji of Nogama in Chikhli taluka. A woman of about 30. Had Entropium in both eyes. Was sent to the Civil Hospital Surat, where she was operated on for the Entropium.

Daylo Lalo of Rentlao in Pardi taluka. Age 20. Right eye lost. In left there was dense opacity and no sight, though there were marginal spaces. Was sent to Dr. Pardivala, who performed an iridectomy on the left. He got a little vision.

Janu Piria Dhodhia of Bulsar. A woman of 20. Had mature cataract in left eye, with no sight; immature cataract in right with slight vision. Was taken to Dr. Pardivala who operated on the left by Smith's intracapsular method. Result was excellent, and she got good vision in that eye.

Lacho Chanji Dhorio of Velparva in Pardi taluka. Age about 35. Had cataract mature in left with no sight; possibly slight sight in right (immature cataract). Was sent to the Municipal Dispensary at Bulsar, where he was operated on for cataract on 22nd February 1915, with good result. I saw him in June 1915, when he had good sight.

Bapurio Debho Dhoria of Sukhes in Pardi taluka. Age about 55. Had mature cataracts in both eyes. No sight. Was sent to the Municipal Dispensary at Bulsar, where he was operated on for cataract. (No note as to result.)

Shankario Lalo of Sodhalwara in Pardi taluka. Age about 55. Had mature cataracts in both eyes. No sight. Was sent to the Municipal Dispensary at Bulsar, where he was operated on for cataract. (No note as to result.)

Samlo Kalyo Kumbhar of Vagchipa Mota in Pardi taluka. Age about 50. Had cataract mature in left, immature in right eye. Was sent to Bulsar Municipal Dispensary and operated on for cataract in left. Was seen by me on 2nd May 1915, when he had fair vision in left eye.

Kikla Chaka of Paria in Pardi taluka. Age 40. Had cataracts in both eyes, mature. No sight. Was sent to Bulsar Municipal dispensary, where he was operated on for cataract. Result satisfactory.

Govan Dulab of Kachigam in Bulsar taluka. Age about 45. Had cataracts mature in both eyes. No sight. Was sent to Bulsar Municipal dispensary and operated on in both eyes on 27th January 1915. The result was very successful and he had good vision. He was subsequently called to Dr. Pardivala's at Bulsar and given spectacles.

Sukha Nichha Koli of Undach Luhar in Bulsar taluka. Age about 45. Had opacities and entropium. Some sight. Was sent to Bulsar dispensary where he was operated on for entropium.

Manli Bavla Gosla of Rola in Bulsar taluka. Age about 50. Had cataracts in both eyes. Was sent to Bulsar dispensary, and operated on for cataracts.

Dayali Nicha Ravia of Chanvai in Bulsar taluka. Age about 45. Had cataract mature in left eye, immature in right. Was sent to Dr. Pardivala of Bulsar, and operated on for cataract by Smith's intracapsular method.

Jamna Paragji Kalyanji of Fanaswada in Bulsar taluka. Cataracts mature in one, immature in other. Was sent to Dr. Pardivala of Bulsar where she was operated on, on 26th May 1915. (No note as to result.)

Bardoli, Mandvi and Jalalpur, Talukas of Surat District.

Jesla Vangra Chodra of Wanskui in Bardoli taluka. Age

25. Had staphyloma in right eye; and dense opacity in left eye. He had very little, if any, sight. There was a clear space in the cornea above the opacity in the left. Was sent to Bardoli dispensary where an iridectomy was performed by Sub-assistant Surgeon Bankay Behari on 30th November 1915. As a result he got fair vision in the left eye.

Relki Duba Chodra a woman of about 22 Quite blind with cataract in both eyes. Seen in November 1915 at the village of Madi. Was sent to Bardoli dispensary and operated on for both eyes by Sub-assistant Surgeon Bankay Behari. Was subsequently seen by me and had very good vision then.

Laljiabhai Bawa Himatsing of the village Kosadi in Mandvi taluka. A boy of five. Had juvenile cataracts. Quite blind. Sent to Bardoli dispensary. The needling operation was performed twice by Bankay Behari. He appeared to have some vision after the operations, but further needling is probably required.

Nakto Teslo Chodra of Kharera in Mandvi taluka. Another juvenile cataract case. Blind. Was sent to Bardoli dispensary, and needled once on 30th April 1916. Result is not known, and parents refused to come again for a second needling.

Kutro Punio Dublo of Bhamaia in Bardoli taluka. A boy of 8. Had staphyloma in left eye and opacity covering pupil in the right. No sight in either eye, but there was some clear space above the opacity in the right. Was sent to Bardoli dispensary where iridectomy was performed in the right on 24th Jan. 1916 by Sub-Assistant Surgeon Bankay Behari. From this he got fair sight in the right.

Nasli Bhimchi Lachio of Mandvi. Four years old. A case of juvenile cataracts in both. Was sent to Bardoli dispensary and had the needling operation done once in both eyes on 24th March 1916 by Sub-Assistant Surgeon Bankay Behari. Was seen by me on 8th May 1916. He then had fair sight in left; and a little in right eye. Was unwilling to go for a second needling.

Juli, widow of Chita Bhila of Vegi in Mandvi taluka. A woman of 35 or 40 with cataracts in both eyes. No sight. Was sent to Bardoli dispensary, and operated on, on 23rd March 1916 by Bankay Behari, with good result. Was subsequently seen by me in May, when she had very good sight.

Pirio Daji Ghanchi of Uskhed in Mardvi taluka. Age 45. Had cataracts mature in both eyes. Was sent to Bardoli dispensary where his left eye was operated on, on 18th May 1916 by Bankay Behari and he was discharged, with good vision on 2nd June 1916.

Chitali Koyalo Hario of Varethi in Madvi taluka. A woman of 25. She had opacities in both eyes and sight, as a result apparently of small-pox. Was sent to Surat to the Parekh dispensary but refused an operation. Subsequently was called to Bardoli dispensary where an iridectomy was performed on her right eye by Mr. Bankay Behari on 30th April 1916. As a result, she got very fair vision in her right eye.

Somli Gomo Dublo of Nasura in Bardoli Taluka. A woman of 25. Had entropium in both eyes. Was sent to Bardoli dispensary and had operation for entropium in her left. As this operation was done by Arlt's method under which recurrence is frequent, she was again sent for and taken to Dr. Chipkar at Prekh dispensary, Surat, who operated on both eyes by Herbert's method.

Raml Kikla Nasna of Jamania in Valod peta of Bardoli taluka. Age about 40. Had entropium in both eyes. Was sent to Bardoli dispensary, and operated on in one eye for the entropium.

Revali Ukla of Isroli in Bardoli taluka. A girl of about 18. Seen in January 1916. Her left eye was destroyed. In the right eye there was opacity, and no sight. There was some clear space above the opacity, and perception of light. Was sent to Bardoli dispensary where an iridectomy was performed by Mr. Bankay Behari on her right eye on 27th April 1916. As a result she got a little vision sufficient to see her way about.

Bhanio Motio Dublo of Mota in Bardoli taluka. Had mature cataracts in both eyes. Age about 50. Was sent to Bardoli dispensary where operation was performed by Mr. Bankay Behari in the right eye, as a result of which he got good vision in that eye.

Lakri Mangalio Bhanio of Vadoli in Bardoli taluka. Age about 40. Her right eye was lost. She had entropium in the left. Was sent to Bardoli dispensary and operated on for entropium in the left. This was done by Arlt's method. By July 1916 there was recurrence. She was brought to Dr. Chipkar at Parekh dispensary, Surat, in order to have the operation done again by Herbert's method. She however went away and declined to come again for the operation.

Gomat, wife of Ranchhod Bhika of Tarsadi in Jalalpore taluka. Age about 45. Had entropium in both eyes. Was sent to Bardoli dispensary and operated on for the left eye on 2nd April 1916. As the operation was done by Arlt's method under which recurrence is frequent, she was called to Parekh dispensary, Surat, where Dr. Chipkar again operated on both eyes by Herbert's method.

Kesar Mithal of Tarsadi in Jalalpur taluka. Age about 45. Had cataract, mature in right, immature in left. Was sent to Bardoli dispensary and operated on in right eye and got good vision in that eye.

Ladki Fakir Jivan of Bhatai in Jalalpor taluka. Age about 47. She had cataracts in both eyes. Was sent to Bardoli dispensary and operated on for the right eye by Mr. Bankay Behari and got good vision in that eye.

Devli, wife of Kalia Lakhia of Vachharwad in Jalalpor taluka. Age about 40. She had cataract mature in right eye, immature in left. Was sent to Bardoli dispensary and operated on in right eye by Mr. Bankay Behari on 17th May 1916, as a result of which she got good vision in that eye.

Dudhi Limda Jivan of Sarpor in Jalalpor taluka. Age about 45. She had mature cataracts in both eyes with on sight. Was sent to Bardoli dispensary, and had operation

in right eye on 14th March 1916, and on left on 30th March. As a result, she got good vision in the right eye, and fair vision in the left.

Khushal Jivan of Dabhlai in Jalalpor taluka. Age 40. Had mature cataracts in both eyes with no sight. Was sent to Bardoli dispensary, and operated on by Mr. Bankay Behari in right eye on 18th April 1916 and in left eye on 18th May 1916. He got good vision.

Kuverdi Bapudio Koila of Puni in Jalalpor taluka. A girl of about 15. She had granular lids and opacities in both eyes, with very little vision. Was sent to Bardoli dispensary on 27th April 1916, and received treatment as an in-patient till the 19th May. On discharge her sight was very much improved.

Premli Ratna of Bardoli. A child of one year. Found suffering from purulent conjunctivitis. Sent to Bardoli dispensary on 20th November 1915. Subsequently discharged cured.

Bhulji Gopal Gojia of Varad in Bardoli taluka. Age about 30. Had entropium in both eyes. Was sent to Bardoli dispensary and operated on for the entropium on 24th January 1916. As the operation was done by Arlt's method under which recurrence is frequent she was called to Parekh dispensary, Surat, in July 1916. Recurrence had already begun. She was operated on by Dr. Chipkar by Herbert's method.

Chiba Bhikhla Koli of Godavadi in Mandvi taluka. Age about 48. Had cataract mature in right, immature in left. Was sent to Bardoli dispensary and operated on successfully in right eye by Sub-Assistant Surgeon Mr. Bankay Behari.

Gowardhan Gowind of Syadla in Bardoli taluka. Age about 35. He had cataracts in both eyes and pterygium in right eye. No sight. Was sent to Bardoli dispensary, where the pterygium was removed on 30th December 1915. Afterwards he was operated on for the cataract, and as a result got good vision.

Bhango Lalio of Kalamkuva in Bardoli taluka. Age

about 35. Had cataract in both. No sight. Was sent to Bardoli dispensary, where he was operated on by Mr. Bankay Behari on 26th January 1916, with very good result.

Shivali Nana Chodra of Luwarwad in Mandvi taluka. A woman of about 20. Her right eye was lost. In the left she had dense corneal opacity covering the pupil. No sight. There was a clear space in the cornea above the opacity in the left. She was sent to Bardoli dispensary where an iridectomy was performed on the left eye on 25th January 1916 by Mr. Bankay Behari. The result was very satisfactory. I saw her on 8th May 1916. She then had good vision in the left eye.

Phujri Phulio Gorkhio of Kharoli in Mandvi taluka. Age about 38. Cataracts in both eyes. No sight. Was sent to Bardoli dispensary, and operated on in both eyes by Mr. Bankay Behari. As a result good vision.

Tewli Badgo Khalpo of Nogama in Mandvi taluka. A woman of about 40. Had mature cataracts in both eyes. No sight. Was sent to Bardoli dispensary, and was operated on in both eyes in February 1916, with success by Mr. Bankay Behari. I saw her on 7th May 1916, when she had good vision in the right, though little or none in the left.

Afinia Thagia Gamta of Kosambia of Valod peta in Bardoli taluka. Cataracts in both eyes. One mature; other immature. Was sent to Bardoli dispensary, where operation was done on the mature cataract successfully by Mr. Bankay Behari.

Ladki Budhia Fakira of Bardoli. 15 days old. Was found suffering from ophthalmia neonatorum by the Sanitary Inspector in the course of his inspection of children after birth. Taken to Bardoli dispensary and treated for some days till cured.

Devi Kikabhai of Vegam in Jalalpor taluka. A woman of about 30. Had entropium in both eyes. Was called to the Parekh dispensary in Surat, and operated on by Dr. Chipkar for the entropium in one eye on 29th June 1916.

Kesar, widow of Pema Gowan of Mogar in Jalalpor taluka. Had entropium and opacities in both eyes. No

sight. Was sent to Parekh dispensary and operated on by Dr. Chipkar for entropium in both eyes on 29th June 1916. Iridectomy remains to be done (24th July 1916).

Samli Gopal Kumbi of Kachholi in Jalalpor taluka. Had entropium in both eyes. Age about 45. Was sent to Parekh dispensary and operated on for entropium on both eyes on 2nd July, 1916.

Manchi Sakan Koli of Kachholi in Jalalpor taluka. Age about 30. She had entropium in both eyes. Was sent to Parekh dispensary and operated on by Dr. Chipkar, in both eyes on 2nd July, 1916.

Moti Dulab Parsotam of Mandir in Jalalpor taluka. Age about 35. Had entropium in both eyes. Was sent to Parekh dispensary and operated on by Dr. Chipkar in both eyes on 6th July, 1916.

Mani, daughter of Pema Jivan of Matwad in Jalalpor taluka. A girl of about 20. Had juvenile cataracts of long standing. No sight. Was sent to Parekh dispensary. Dr. Chipkar first needled one eye, and subsequently extracted the lens of that eye. There seemed, however, to be some fundus trouble, and the result was not successful.

Jivkore Parsot Harakaji of At in Jalalpor taluka. About 40. She had entropium in both eyes. Was sent to Parekh dispensary and operated on for entropium in both eyes.

Ghela Parbhu of Dhamrod (in Baroda territory) near Bardoli. Age about 30. This man had come to the Bardoli dispensary in September 1915, and been operated on for entropium in both eyes. In May 1916 he had glaucoma and there was some recurrence of the entropium. Was sent to Parekh dispensary and operated on for glaucoma by Dr. Chipkar, in July 1916.

Atmaram Ranchoddas of Mota in Bardoli taluka. Age about 30. Glaucoma in both eyes. Sight in left *nil*, in right slight. Was sent to Parekh dispensary and operated on in the left eye on 16th July, 1916, and subsequently in the right eye.

Kuver, widow of *Raja Dulab* of Ambada in Jalalpor taluka. Age about 40. She had entropium in both eyes. Was sent to Parekh dispensary and operated on in both eyes by Dr. Chipkar.

Diwali Ranchhod of Surat. A girl of about 12. Had entropium in both eyes, and would have lost her sight. Was taken to Parekh dispensary and operated on by Dr. Chipkar in June 1916 in both eyes. The result was very satisfactory, and the sight was saved.

Divali Narayan of Ninat in Bardoli taluka. Age about 30. Had entropium in both eyes. Was operated on for entropium at Bardoli in September. The operation was done by Arlt's method. By January there was already some recurrence. She was sent to Parekh dispensary in Surat in July 1916, when Dr. Chipkar operated again for the entropium in both eyes by Herbert's method.

Hario Chirio of Amalsadi in Bardoli taluka. Age about 40. Right eye lost. In left entropium; also leucoma. Fair sight. Was sent to Parekh dispensary, Surat, where he was operated on for the entropium by Dr. Chipkar on 13th August 1916.

Lalubhai Surbhhai of Kalianwadi. Age about 30. An assistant schoolmaster at Dungri, taluka. Bulsar. Had entropium in both eyes. Was sent to Dr. Chipkar at Parekh dispensary, Surat, where he was operated on for the entropium in both eyes on 6th August 1916.

Manchi Chela Virchand of Vankaner in Bardoli taluka. Age about 40. Entropium in both eyes. Was sent to Parekh dispensary and operated on for entropium in both eyes by Dr. Chipkar on 20th August 1916.

Diwali Bhawania of Kantali in Bardoli taluka. Age about 45. Entropium. Was sent to Bardoli dispensary and operated on by Sub-Assistant Surgeon Bankay Behari in both eyes for entropium on 13th August 1916.

Chalisgaon, Jamner and part of Pachora Talukas of East Khandesh District.

Maini Manglia Bhil of Takli in Chalisgaon taluka. A girl of 2 years of age. When seen in December 1914 she had no sight. She was sent to the dispensary at Chalisgaon, where the Sub-Assistant Surgeon diagnosed the case as "optic atrophy." At any rate she had an illness after which she had lost her sight. She was put on some iron treatment,* and eventually recovered her sight. The Sub-Assistant Surgeon reported on 15th August 1915, that she sees well.

Namdeo Mohun of Bikangaon in Chalisgaon taluka. Age 55. Right eye destroyed. Left eye opacity cornea, with no sight. Was sent to Chalisgaon dispensary where an iridectomy was performed. He got slight vision.

Jani Manaji of Wadgaon Lamba in Chalisgaon taluka. A woman of about 30. With mature cataracts in both eyes. No sight. Was taken to Chalisgaon dispensary, and operated on for cataract in January 1914. I saw her in April 1914, when she had fair sight in the eye operated on.

Ranji Laxman of Chichkheda in Chalisgaon taluka. Age about 60. Had Mature cataracts in both eyes. Was sent to Chalisgaon dispensary, where he was operated on for cataract in one eye. Result appears to have been moderate, as the Sub-Assistant Surgeon reported that he got "fair vision".

Baya Nathu of Tirphal in Chalisgaon taluka. Age about 45. She had cataracts in both, mature in right eye. Was sent to Chalisgaon and operated on in one eye. The Sub-Assistant Surgeon reported that she got some sight after the operation and "could see near objects".

Bandu Tukaram of Andheri in Chalisgaon taluka. A boy of about 8. Had opacities in both eyes after small-pox. No sight. He was sent to Chalisgaon dispensary, where an iridectomy was performed by Sub-Assistant Surgeon Varti in May 1914. This was successful and he got some vision. Sub-Assistant Surgeon Desai saw him later, about December and reported that he "sees fairly."

*Ferri carb-sulph.

Fonzia Haibati of Ranjangam in Chalisgaon taluka. Age about 30. Mature cataracts in both eyes. No sight. Was sent to Chalisgaon dispensary where operation was performed on one eye. The Sub-Assistant Surgeon reported that he got fairly good vision.

Suder Arjun of Wakdi in Chalisgaon taluka, Age about 45. Had entropium. Was sent to Pachora dispensary and operated on for entropium, and said to be "cured."

Tulsi Govinda of Kirgaon in Chalisgaon taluka. A woman of about 55. Cataract mature in one; immature in other. Was operated on for cataract at Chalisgaon dispensary, and got some vision.

Ladkya Chimna of Bhowar in Chalisgaon taluka. Age 25. Right eye lost. Left eye opacity cornea with very slight sight. Was sent to Chalisgaon dispensary where an iridectomy was performed in May 1914. His sight was improved. I saw him on 30th Dec. 1914, and noted that his sight was good.

Tana Ganpat of Hirapur in Chalisgaon taluka. Age 45. Cataract mature in left; immature in right. Was sent to Chalisgaon dispensary, and operated on in the left. He got vision in that eye.

Nathu Manga of Pathoudi in Chalisgaon taluka. Age 30. Had chronic ulcers in both eyes. No sight. Was sent to Chalisgaon dispensary, in May 1914. By continued treatment his eyes were improved. I saw him in December 1914, when he had fair sight.

Rasul Lala of Jamda in Chalisgaon taluka. A boy of 12. He had entropium. Was sent to Pachora dispensary, where he was operated on for the entropium.

Fatma Nanso of Nagardevola in Pachora taluka. A woman of about 20. She had cataracts in both eyes (probably congenital) and was also mentally defective. Was sent to Pachora dispensary and had the needling operation done three times in May or June 1914. Next year in May 1915, Sub Assistant Surgeon Bugwe of Pachora, reported that he thought she had some vision, though it was difficult to tell owing to the mental deficiency. The mother

said that she moved about better in the house since the second needling. The Sub-Assistant Surgeon said the cataract was being absorbed and he had given dionine.

Jamaki Shivram of Samrod in Jamner taluka. Age about 50. Had mature cataracts. Was sent to Chalisgaon dispensary and was operated on. The Sub-Assistant Surgeon reported that she had "good vision after extraction."

Tulsiram Ruhimbau of Ozar Budruk in Jamner taluka. Age 40. One eye destroyed, mature cataract and pterygium in the other. No sight. Was sent to Chalisgaon dispensary and operated on for the cataract. Sub-Assistant Surgeon reported that he had got fair vision after the operation.

Soji Jairam of Tulloda Digar in Chalisgaon taluka. Age 10. Had a staphyloma in left eye, and opacity in right. Sight fair in right. Was sent to Chalisgaon dispensary where the staphyloma was excised.

Hassan Mogal of Lohari in Pachora taluka. Age 40. Cataract in right eye. Was sent to Pachora dispensary, where the cataract was operated on by Sub-Assistant Surgeon Bugwe, successfully.

Sadim Hyder of Lohari Budruk in Pachora taluka. A woman about 40. Had cataracts in both eyes. Was sent to Pachora dispensary and operated on in the left eye by Sub-Assistant Bugwe. (No note as to result.)

Chhiba Mahadu of Wachankheda in Pachora taluka. Age about 45. Cataracts in both eyes. Was sent to Pachora dispensary, and operated on in one eye, successfully.

Panki Appya of Vadgaon Khurd in Pachora taluka. Age about 30. Mature cataract. Was sent to Savda dispensary and operated on for the cataract by Sub-Assistant Surgeon Varti, successfully.

Kondu Bhika of Nimbhora in Pachora taluka. Age about 70. Mature cataract in right eye, immature in left. Was sent to Pachora dispensary and operated on in right eye successfully.

Sita Vithoo of Akhatwada in Pachora taluka. A woman of about 25. Had staphyloma in right eye, and dense opacity

in left. No sight in either. Was sent to Pachora dispensary, where an iridectomy was performed on her left by Sub-Assistant Surgeon Bugwe on 24th May 1914. I did not see result but Sub-Assistant Surgeon records that she was "cured," which must mean that she got some vision.

Umabai Tanoo of Antoorli Budruk in Pachora taluka. Age 50. Entropium. Sent to Pachora and operated on by Sub-Assistant Surgeon Bugwe.

Soni Dhondiba of Satgaon in Pachora. Age 5. Left eye lost. In right eye dense opacity. No sight. Iridectomy was performed at Pachora 25th April 1914 but was a failure.

Bahina Narayan of Saygaon Bildi in Pachora taluka. Mature cataracts in both. No sight. Sent to Pachora, and operated on in both eyes successfully on 11th April, 1914.

Nurkha Jatoo of Pimpalgaon in Pachora taluka. Age 8. Had ulcers of the cornea and some entropium in left eye. He was sent to Pachora dispensary and operated on for the entropium by Sub-Assistant Surgeon Bugwe on 21st April, 1914.

Tukdeo Rama of Verroli Khurd in Pachora taluka. Age 60. Had cataract in both. Was sent to Pachora and operated on in right eye successfully.

Mulkan Lahnoo of Verroli Khurd. Age about 60. Had cataract in both. Was sent to Pachora and operated on. She got a little vision.

Arjun Haibati of Verroli Khurd. Cataract mature in right eye. Age 60. Was operated on at Pachora, unsuccessfully.

Maharoo Sonji of Pahan in Pachora taluka. Age 8.

Good vision in left eye but staphyloma in right. Was sent to Pachora dispensary where staphyloma was removed on 22nd May, 1914.

Gahini Shripat of Vakhari in Pachora taluka (and Nandgaon in Nasik). Age about 25. She had opacities in both eyes, and no sight. She was an accused in my court, and I sent her to Jalgaon Civil Hospital, where she refused an operation. Eventually she was persuaded to submit to an operation at Pachora. An iridectomy was performed in one eye by Sub-assistant Surgeon Bugwe, with good result.

I saw her later in April or May 1914, and she had good sight in that eye.

Kashiram Zinda of Saygaon in Pachora taluka. Age 40. Cataract mature in right eye, immature in left. Was sent to Pachora dispensary and operated on for the cataract in right, successfully, on 23rd May, 1914.

Totaram Ananda of Mondhala in Pachora taluka. Age 45 or 50. Cataracts in both eyes, mature in left, immature in right. Was sent to Pachora dispensary and operated on in left eye, successfully.

Khusba Bhawan of Mandhola. Age 55 Staphyloma in right eye, pterygium in left. Was sent to Pachora dispensary, where the pterygium was removed on 4th May, 1914.

Rama Dasarath of Vanegaon in Pachora taluka. Age 25. Had staphyloma in right eye. He was sent to Pachora dispensary where the staphyloma was removed.

Jai Bhawan of Saygaon in Pachora taluka. Had cataracts in both eyes, overripe in right, ripe in left. Was sent to Pachora dispensary, where the left eye was operated on successfully on 4th May, 1914.

Sakor Ganpat of Saygaon. Age 50. Cataracts in both eyes. Was operated on in one eye at Pachora, but this was a failure.

Baija Tanoo of Vadgaon Ambe in Pachora taluka. A girl of about 8. She had juvenile (congenital) cataracts in both eyes. No sight. Was sent to Pachora dispensary, where the needling operation was performed first in April 1914. A second needling was done on 22nd May, 1914. As a result she got fair vision. On 16th December 1914 the Sub-Assistant Surgeon wrote that she had slight vision and saw to play about.

Shempadu Parasharam of Jamna in Pachora taluka. Age 45. He had opacities in both eyes, and pterygium advanced in the left eye. He had some sight. He was sent to Pachora dispensary, where he was operated on for the pterygium on 4th May, 1914.

Gehinja Nathoo of Jamno. Age 35. He had pterygium

coming over the pupil in left eye and incipient in the right eye. His right eye was otherwise sound. He was sent to Pachora dispensary where the pterygium in left eye was removed on 2nd May, 1914.

Ramgir Gotu of Gudi in Bhadgaon Peta. Age 2. Had staphyloma in left eye and corneal opacity in right. He had little, if any, sight. Was sent to Pachora dispensary where the staphyloma was excised. He was treated for the opacity in the other eye.

Panki Jairam of Antoorli Budruk in Pachora taluka. Age about 30. Her right eye was lost, and she had entropium in the left. She was sent to Pachora dispensary, where she was successfully operated on for the entropium by Bugwe on 23rd April, 1914. Writing on 16th December 1914 the Sub-Assistant Surgeon described the result as good

Jairam Krishna of Tarkheda in Pachora taluka. Age 50. Right eye destroyed; entropium in left. Was sent to Pachora and operated on for the entropium, by Sub-Assistant Surgeon Bugwe,

Malhari Gopal of Tarkheda. Age 35. Cataract in right eye mature. Left eye sound. Was sent to Pachora, and operated on successfully in right eye.

Barkoo Dajoba of Savkheda Hol in Erandol taluka. Age about 8. Had juvenile (congenital) cataracts in both eyes. Quite blind. He was brought to the Pachora dispensary, where the needling operation was performed twice, on 30th April and 1st June 1914. I saw him in December 1914. He then had fair sight. A third needling was done at Dharangaon dispensary by Sub-Assistant Surgeon A. R. Desai in, August 1915, in the right eye. The Sub-Assistant Surgeon reported that he can see well with the left eye, and better than "before" (?) with both eyes. A fourth needling was said to be required.

Bhiki Laxman of Golan in Pachora taluka. Age 45. Cataract. Sent to Pachora dispensary and operated on successfully on 19th May, 1914, by Bugwe.

Malhari Abhaji of Tarkheda Kurd in Pachora taluka.

Age 30. Left eye sound, right eye traumatic cataract. Successfully operated on for the cataract at Pachora on 19th May, 1914, by Bugwe.

Kissan Vithal of Shendurni in Jamner taluka. Age 36. Mature cataract in right eye. Left eye sound. Sent to Pachora and operated on for cataract in right eye. Failure.

Radhi Ragha of Chilagaon in Jamner taluka. A woman of 40. Quite blind, but good clear space in one eye. Was sent to Pachora, where iridectomy was performed by Sub-Assistant Surgeon Bugwe. The result was fair and she got some sight.

Tulsi Devaji of Hivarkheda Digar in Jamner taluka. About 30. Had fair sight, but entropium. Was sent to Pachora and operated on for the entropium on 21st May, 1914.

Hiraman Nathoo of Nanibhora in Raver taluka. Age 40. Entropium. Sent to Pachora dispensary and operated on for the entropium on 22nd May, 1914.

Pandoo Gujar of Napani in Pachora taluka. Age 50. Had some sight, but had entropium. Was sent to Pachora and operated on for the entropium on 24th May, 1914.

Tukuram Mana of Vakdi in Jamner taluka. Age 15. One eye sound. In the other zonular cataract. First needling done on 24th May 1914 at Pachora. He apparently did not come again.

Onkar Shamrao of Shendurni in Jamner taluka. Age about 4. He had a painful staphyloma in the left eye, with discharge, which was affecting the other which was sound. This was on 15th February 1914. He was sent to Pachora dispensary and the staphyloma was excised on 25th May, 1914.

Kalu Abhiman Bhil of Bilakheda in Chalisgaon taluka. Seen in January 1914, when he had pterygium in both eyes. He was sent to Pachora dispensary and operated on for the pterygium successfully on 27th May, 1914.

Vedu Laxman of Ranjangaon in Chalisgaon taluka. Age about 30. Had entropium. Sent to Pachora and operated on

for the entropium on 1st June, 1914 by Sub-Assistant Surgeon Varti.

Thagi Dagoba of Mahodi in Jamner taluka Age 40. She had corneal opacities and entropium. Some sight. Was sent to Pachora and operated on for entropium on 1st June 1914 by Varti.

Sahadev Arjun of Vakdi in Chalisgaon taluka. Age 40. Had entropium. Operated on at Pachora on 1st June 1914 by Varti.

Rahimkhan Jangali of Ranjangaon in Chalisgaon taluka Age 45. Had pterygium. Was taken to Pachora dispensary and operated on for pterygium on 1st June 1914 by Varti

Devrao Sampat of Kurhad Budruk in Pachora taluka. Age 6. Left eye destroyed. Right eye opacity. Not recorded whether he had any sight in right; probably not. Was sent to Pachora dispensary, where an iridectomy was performed in the right eye on 1st June, 1914, with good result, by Varti.

Keshari Onkar of Nandra in Jamner taluka. Age 8. Dense central opacity in right eye. Sight lost Also opacity of lower portion of left eye. Had very slight sight, if any, in left. Was sent to Pachora dispensary, where an iridectomy was performed on the left eye on 1st June, 1914, by Sub-Assistant Surgeon Varti. Result not known at the dispensary. Mamlatdar of Jamner reported on 20th Dec. 1914 that she can see a little.

Soya Dhanji of Vazar in Pachora taluka. Age 50. Cataract. Left eye. Operated on by Sub-Assistant Surgeon Varti on 2nd June, 1914. Unsuccessful.

Nagabai Tukaram of Mondhola in Pachora taluka. Age 40. Cataracts in both eyes. Operated on at Pachora dispensary by Sub-Assistant Surgeon Varti on 2nd June, 1914. Successfully.

Radhi Ganpat of Nimkheda in Jamner taluka. A woman of 26. Left eye lost. In right eye she had pterygium advanced and nearly covering the pupil Was sent to Pachora dispensary and operated on for the pterygium by Sub-Assistant Surgeon Varti, on 2nd June, 1914.

Dagdi Bhika of Raipuri in Chalisgaon taluka. Age about 10. She had juvenile cataracts in both eyes. No sight. Was sent to Pachora, and had needling operation done by Varti on 2nd June, 1914. She was subsequently needled again, either at Pachora or Chalisgaon. I saw her in December 1914. Absorption was good, but it was doubtful whether she had any sight. There was probably some fundus trouble. She was put on iron treatment. The Sub-Assistant Surgeon Chalisgaon wrote on 18th April, 1915: "Absorption has taken place and she could see little in one eye only. She was on iron treatment" Altogether a case of very doubtful success.

Gulja Kalu of Vakdi in Jamner taluka. Age 30. Right eye lost. In left eye she had pterygium nearly covering pupil. Was sent to Pachora and operated on for pterygium by Sub-Assistant Surgeon Bugwe on 7th June, 1914.

Kantik Soma of Yaval. Age 20. Entropium left eye. Was sent to Pachora dispensary and operated on for entropium by Bugwe on 7th June, 1914.

Baija Sakham of Tarkheda in Pachora taluka. Age 35. Entropium left eye. Sent to Pachora and operated on by Bugwe for entropium on 10th June, 1914. Sub-Assistant Surgeon Bugwe reported on 16th December 1914 that the result was good.

Rakhma Ambalal of Damangaon in Chalisgaon taluka. Age 20. Cataract in left eye; right eye sound. Was sent to Chalisgaon. The left eye was needled, and she got fair sight in that eye.

Narayan Tukaram of Faizpur. Age about 10. Had juvenile cataracts in both eyes. No sight. Was sent to Savda dispensary, where needling operation was done twice by Sub-Assistant Surgeon Varti. The Sub-Assistant Surgeon reported subsequently in August 1914 that his sight had "much improved."

C. G. HENDERSON.

SURAT, 2-9-16.

THE BLIND IN INDIA

(*A lecture delivered at the College of Ambulance, London, on January 12th, 1918, under the Chairmanship of Surgeon-General G. F. Evatt, C.B.*)

Mr. Chairman, Ladies and Gentlemen,

The subject I wish to bring before you to-day suffers from this disadvantage that it is not strictly a war subject. Except so far as there must be in India to-day many blinded soldiers, it can hardly be connected directly with the War at all. You must therefore consider it largely as an after-the-War Subject, one of those problems which will be facing us and which, it is to be hoped, we shall try to tackle in those times when the War is no more and Victory has crowned all our efforts and sacrifices.

The number of totally blind people in India is said to be about 600,000.* Taking the population of the country at about 300 millions, you will see that the incidence of blindness works out at about $1\frac{1}{2}$ per thousand of the population. Some parts of the country are worse and some better. In Sind for instance the incidence is as high as 4 per thousand, a very high figure. But taking the average it works out to about $1\frac{1}{2}$ per thousand. These are Census figures and it is by no means certain that they are not defective. It must also be remembered that they relate only to the totally blind; they do not include one-eyed people or partially blind people or people with just a little sight. That is to say they do not include all of what has been called *economic blindness*. In England you find in blind schools quite a number of children who have a fair amount of vision, but it is considered that their capacity and efficiency are so much impaired by their loss that even though they can perhaps see to go about by themselves or even read a little, they are not fit subjects for the education of ordinary schools but must be taught in blind schools. Now if all such people in India, people whose

* v, however Note on p. 46 *infra*.

efficiency is aeriously impaired by partial loss of vision, where included in the figures, they would, I believe, be something surprising. We have of course no definite statistics in regard to partial blindness, but it is quite certain that the figure for totally blind persons of $1\frac{1}{2}$ per thousand of the population (even if correct) does not in any degree represent the havoc wrought by eye disease in India.

It is not very difficult to point to some of the causes or conditions of these results. In the first place there are the physical characteristics of the country itself—the intense sunlight, the heat and perhaps above all the dust and the flies. We know that all over the East and in tropical or semitropical countries the incidence of blindness is very high. In Egypt I believe it is terrible. I have seen it stated that the incidence in that country is 14 per thousand, though whether this applies only to the totally blind or includes also the partially blind I do not know. Syrai again is very bad. In Turkey, says Dr. Alden Hoover, a Medical Missionary of the Medical Board of Foreign Missions, trachoma is so prevalent that there should be a clinic for treating it in every city of the country. The amount of defective vision and consequent inefficiency is incalculable. The prevention of blindness, by the control of trachoma, gonorrhoeal ophthalmia and small-pox, would be one of the greatest blessings America could give to Turkey. The field for the eye specialist, he says, is unlimited.

Then of course, in India, outside the larger towns the application of sanitary science is practically nonexistent. Further there is a great need of increased medical facilities, as the Government itself fully acknowledges. But without discussing the causes of this deficiency, let me roughly indicate the sort of provision generally existing, at least in those districts with which I am acquainted. Suppose an area about the size of Kent, Surrey and Sussex put together; in that large district you would have one Central Government hospital and eight or ten small dispensaries, many of them not very efficient, dotted about in the small towns. There are also a certain number of qualified private medical practitioners, but these generally live in the towns and do

not touch the villages to any great extent. Add to this the fact that communications are generally bad. A metalled road is something of a luxury, and in the rainy season large tracts of country are practically impassable for wheeled traffic, so that if, in the rains, a man wishes to take his family to a dispensary or hospital he will very often be unable to take them in a bullock-cart but will have to wade with them ankledeep in mud for many miles.

But we must not lay all the blame entirely on these conditions. We have to take into account the backwardness, ignorance and superstition of large masses of the people, which not only prevent their taking full advantage of such medical facilities as are available but often throw them into the hands of thoroughly incompetent and dangerous native quacks.

The practices of these native quacks are, by the way, of considerable interest, and would be in many respects amusing, where they not so serious. One of the best known operations performed by them is that of "couching" for cataract, that is, displacing or depressing into the eye-ball the lens of the eye with a needle, instead of extracting it, which is of course the usual operation in modern Western surgery but which would be entirely beyond the capacity of these men. The results of these operations of couching are generally disastrous, as may readily be imagined when the conditions are understood. A dirty needle or probe is taken from a dirty bag or perhaps a roll of dirty bedding, and of course without being in any way rendered aseptic or, at best, wiped upon a dirty rag, is plunged into the delicate structure of the eye. A violent inflammation is the frequent result and the eye is destroyed. In many cases the patient is told beforehand that only some medicine is to be dropped into the eye; then the operator, before commencing his surgery, covers his own head and that of his patient with a cloth, just as a photographer covers his own head and his camera when taking a picture. This is presumably to hide the nature of the operation from the onlookers. It is not only on the battlefields of Europe that the art of camouflage is understood; in a thousand villages in India it is practised

by the humble native quack. Strange as it may seem, the operation does not always end so disastrously; in a few cases a man will as a result get his sight at least for a time, much, we may imagine, to the glory of the village doctor, and it is perhaps not altogether right to class all these men as quacks; some of them are quite skilful so far as the actual operation is concerned and they are only carrying out, according to their lights, an operation which is immemorial in the East and not so very long ago was the common practice in the West as well. But what a thousand pities that the conditions should be such that a man will submit to a treatment for which perhaps he will be charged an exorbitant fee and in which the chances are twenty to one that his eyes will be ruined, when he might, perhaps at some inconvenience, go and stay for ten days as an inpatient in a Government Hospital, where the chances would be a hundred to one that he would receive his sight. And it is not only in surgery but also in the use of medicines that these quacks are so destructive. They use irritants and also all sorts of drugs in eye diseases which have most disastrous effects. You will perhaps ask with surprise and some indignation, Why is this state of things allowed, why is not the quack suppressed? In reply to which I might ask you another, Why is he not suppressed in England? However there is no doubt that he ought to be suppressed. He does a great deal of harm both directly and indirectly in preventing people from taking proper medical treatment.*

I have now attempted to describe to you the conditions under which blindness and impairment of vision are so prevalent—the physical characteristics of the country, the poverty of medical facilities, the lack of good communications and above all the backwardness, ignorance and apathy of large masses of the people. It is perhaps not surprising that we find that most of the blindness that prevails is preventible blindness, but is unfortunately not prevented and secondly that a great deal of the existing blindness is actually remediable but is not remedied.

*For a full account of these "eye doctors" see Elliott's "Couching for Cataract" (Lewis & Co. 1917).

I want particularly to insist on these two points. They are in fact the central theme of all I wish to say. I will take the latter point first. There is submerged in the Indian villages (and in the towns too for that matter) hidden from view, a great mass of human affliction which is, could it be found out and brought to light, readily capable of alleviation, numbers of people who are to all practical purposes blind, who probably think themselves and are thought by their relations and acquaintances to be *irretrievably* blind, but who, on the contrary could be given their sight or at least a considerable degree of sight. Very largely these are cases of cataract, the so-called senile cataract. Very common indeed are these cases. Cataract comes on early in the East. It is seen frequently in middle-aged people; sometimes in people as young as 30 or 35. Perhaps ninety per cent. of these people could be cured, that is given their sight. Some of them do go to the hospitals, especially if there is within fairly easy distance some well-known and successful surgeon. But unfortunately great numbers of them do not go. They are too ignorant and fatalistic; or too timid; or perhaps they prefer to wait till the travelling quack comes along and have their cataracts couched in the manner and usually with the disastrous results I have previously described. Then again we get numbers of cases of corneal opacities. A man or woman or child suffers from some kind of ophthalmia, which if it does not destroy his eyes altogether may leave thereon dense opacities, and when these cover the pupils he is of course blind; but if there is, as there often is in such cases, any clear portion of the cornea left intact, then there is always the chance that by the beautiful little operation of iridectomy, or the cutting of a new pupil in the clear portion of the cornea, the sufferer may be restored to a measure of vision. But of course most of the people do not know this and so they remain blind, and an operation like this is, fortunately no doubt, quite beyond the ambition of the village doctor. Then again there is a kind of cataract known as juvenile cataract—cataract in children—rare I believe in England but quite common in India. Congenital these cataracts in many cases seem to

be, and apparently hereditary, hereditary perhaps in those cases where they are congenital. In any case they seem to run in families, sometimes skipping a generation or coming out in a collateral branch of the family. You find a child in a village with cataract, and if you persist long enough in your enquiries you will very frequently find that if his father or mother did not have such cataract, his grandfather, or his uncle or aunt or sister or cousin has or had it—or you may actually see it in two or three of the family at once, and the father with it as well,—or a child is brought with cataracts in both eyes: you look at the mother and find that she has it in one eye. There is, by the way, a very good reason why you should find the mother with cataract in only one eye, because if the mother had had it in both eyes she would probably never have been married. In India it is difficult for a totally blind girl (or even for a man) to get married. Nobody wants her; she is no use; she can't cook or sweep or fetch the water from the well, and so she remains, a sightless spinster all her days. So much is this so that one often hesitates to urge upon the sufferers or their parents to have the operation which will restore their sight performed, because if the child is operated on, gets his or her sight, grows up and gets married, he or she is, by the possibility of transmitting the defect, a menace to an unborn generation, perhaps to more than one generation, whereas if he remains blind and unmarried the defect, so far as he is concerned, dies with him, though of course it must be remembered that his brothers or sisters too, in whom the disease may be latent, though their own sight is perfectly good, may possibly just as much transmit the affliction. I am speaking of course of congenital cataract and not of other types of blindness. However this is something of a digression. The fact remains that many of these classes of juvenile cataract are remediable. I remember the case of a little girl who had been operated upon and had very good sight, and they told me her history. She belonged to a mission in one of the villages. The missionaries thinking her irretrievably blind sent her to blind school in Bombay. There she remained for some time being taught as a blind child, until

by chance one day a medical man, quite unconnected with the school, paid a visit of inspection, saw the child, picked her out at once, and sent her to the eye hospital in Bombay, where she was operated upon and returned to the mission up-country with perfectly good sight. I have described this case, because it is a good instance of the terrible amount of unnecessary suffering, the waste of human lives, which exists just for want of a little knowledge. The villagers did not know, the missionaries did not know, and apparently even the authorities of the blind school did not know, that this was not a case of hopeless blindness, and had it not been for a lucky chance, the girl might have been doomed to a life of darkness. In case any of you know anything about the blind schools of Bombay, (there are two or three) I ought to say that the school in question is not the principal school known as the Victoria Memorial School, which in this respect is beyond reproach. The Victoria Memorial School is managed by a medical man, a L. M. S., himself blind, and every child who is sent there is, on admission, invariably sent to the eye hospital for examination. This gentleman has told me that many children sent to the school as blind have been operated on at the eye hospital and received their sight; which is again an instance of the extraordinary ignorance or rather lack of inquiry which prevails on this subject. It never seems to occur to people that before condemning a child to a life of blindness it would be as well to see whether anything can be done for him to give him his sight.

To return to our villages. Besides the cases I have referred to, you get large numbers of cases of what is called entropion, where, owing to the effects generally of trachoma or granular ophthalmia, the eye-lashes of the patient are turned into the eye and the cornea is being slowly sloughed away. These cases call for operation and can be alleviated in that way and the sight saved. But it is simply amazing that these people will remain month after month, perhaps year after year, suffering from what must be a most irritating and painful complaint and never seek medical relief.

Now all these cases, of cataract, opacities, entropion, etc. want finding out and helping. Like the German fleet, they want "digging out," and not only these, but a multitude of people suffering from eye diseases which, if left untreated, may lead to loss or impairment of vision and which, from their infectious nature are a menace to their neighbours and, because they are never stamped out, serve as a perpetual source of danger and suffering.

This brings me to my second point—the question of prevention, which is still more important. For though out of the partly or totally blind you get a percentage who are operable cases, whose sight can be improved or restored, there is still a much larger proportion who cannot be cured. That is, they cannot be cured *now*, but they could have been cured at an earlier stage. In other words, their blindness could have been prevented. And to-day, every day, year after year, the same process is going on, the process of recruiting the ranks of the blind out of the numbers of sufferers from eye diseases which if not treated will result in that disaster. Out of the 600,000 blind in India, it is probable that four hundred or five hundred thousand need not have been blind if they had been properly treated. And as the older blind die off, their places are taken by others, and every generation four or five hundred thousand people go blind who ought not to go blind. Such diseases as conjunctivitis, trachoma, pannus, keratitis, etc. need not lead to blindness, if treated in time, but if not treated, they often result in blindness. In a recent number of the *British Journal of Ophthalmology*, the following statement is made by Col. Elliot: "I say deliberately, and as a result of an exceptionally large experience in the treatment of granular ophthalmia, that it should never be permitted to cause the slightest diminution in the acuity of a patient's vision if treated from the first. The pannus and keratitis of trachoma, with the subsequent clouding of the cornea are all preventible if the patient seeks relief early enough." Then we have the terrible scourge of ophthalmia neonatorum, the purulent conjunctivitis which attacks children at birth or shortly after and so often results in total blindness, but which can

be conquered if proper medical treatment is taken in time. In England and America of recent years the greatest efforts have been made to forestall the results of this infection, and prevent newly born children from going blind, but in Indian villages, where there is no one to help or advise, how often must this tragedy occur?

The extent to which conjunctivitis of different kinds, and more particularly granular conjunctivitis, prevails is enormous. This can be seen very markedly in the schools, 30 or 40 per cent. of children often being infected. In one girls' school I remember finding as many as 70 per cent. of the girls infected with conjunctivitis mostly of the granular kind. This is but a reflexion of the general condition amongst the population. When one regards the extent to which granular ophthalmia prevails one is inclined to wonder, not that the incidence of total blindness is 2 or 3 or 4 per thousand, but that the figures are not reversed and that there are more than 2 or 3 per thousand with more or less undamaged vision.

I have endeavoured to place before you, in the rough, a picture of the problem as I conceive it to exist. The question is—is there a remedy? It is possible no doubt to approach such a subject along many different lines, educational, sanitary, economic and medical. The general advance of the country along the lines of what is generally termed "civilisation" will do something no doubt to help in the solution of this as well as of other problems. But it is a slow process, and it will not do to leave too much to it. While not wishing in any way to prejudice the consideration of proposals that might be advanced to meet the problem, may I be permitted briefly to suggest one possible scheme?

The establishment of more eye hospitals, dispensaries and clinics would be an admirable measure and given a steady supply of philanthropic millionaires much might be accomplished in this way. But even so, the problem is not wholly one of the provision of adequate medical facilities. The need is for a close and intimate personal contact, the

need which even in advanced England is recognised and has given rise to that modern phenomenon, the Health Visitor. In Indian villages you can hardly have what would exactly correspond to Health Visitors, but you might have in each village or group of villages a man who would have sufficient elementary training to be able to diagnose the more obviously operable eye cases, get into touch with them and arrange for the necessary treatment at hospitals or in the way I shall shortly suggest. Let me call him, for the present, a field worker. Suppose we were trying to work a scheme like this in a district of a million or three quarters of a million inhabitants. We would employ a fully qualified and competent ophthalmic surgeon, who would be a native of India, and perhaps give him two or three assistants of the grade of what are called Sub-Assistant Surgeons. It would be the business of this ophthalmic surgeon to give the necessary elementary training to the men we have called field-workers, and when these field-workers were trained they would be placed, one in each village or group of villages (of, say, about 5,000 inhabitants). These men would have to reside in the villages, and constantly go about there charge, finding out and keeping in touch with eye cases, keeping careful registers of them, sending them to hospitals or producing them at the visit of the ophthalmic surgeon. I will even go so far as to suggest that they might be trained up to the point where they would be capable of themselves treating the simpler forms of eye diseases (or perhaps I should say eye diseases in their earlier stages) which are so very numerous and if neglected often lead to loss or impairment of vision—such cases, for instance, as require little more than washing and the instillation of eye drops. They would have, of course, to keep very careful registers and be under the constant supervision of the ophthalmic doctor and his assistants. But their equipment need be but a small one. With a medicine chest, a few note books or registers, and their own good will and bodily activity, such men might do a great deal. Or, if this is going too far, they might be restricted to carrying out a continuation treatment, under the doctor's instructions and

supervision, just as a compounder in a dispensary often carries on a treatment after the doctor has seen the case and given his instructions. The great point would be to teach them what to do and what not to do.

Another way in which they might be of great use would be in visiting daily all children born in the villages, for 10 or 12 days after birth, for signs of ophthalmia neonatorum, and in taking the necessary steps where the disease was found.

The work might be described as a sort of "First Aid" in eye cases.

Our ophthalmic surgeon and his assistant would have to be constantly on tour, inspecting and supervising and perhaps treating the more difficult cases, and the ophthalmic surgeon could operate in the villages on those cases which it was found difficult to get to hospitals.

In regard to working with men not fully qualified in the medical sense, it may be remarked that this has already been done by medical missionaries in Southern India, and in China there are Missionary Colleges which turn out students (not fully qualified) for practice in the villages. The Government of India itself, in 1916, approved the Hon. Dr. Banerjee's proposal in the Viceroy's Council, to establish a class of practitioners who should be trained only up to a certain point (not fully qualified) and for practice in rural areas. The principle that none but fully qualified men should touch a case can hardly be adhered to in a country like India, and the Government of India is of this opinion. The need is so tremendous, and so much can be done by men with more or less elementary knowledge that we should seem to be justified till something better can be done.

This scheme, it will be seen, would be worked by native agency. That is necessary for purposes of economy. But it would be all the better, under present conditions at least, for European control and supervision. That is where the European volunteer would come in. You would want a fund, and you would want people to organise and direct in different districts. No doubt if some financial help was forthcoming the services of such bodies as missionary societies

could be enlisted. Missionaries are often in a peculiarly favourable position for carrying out work of this sort. A medical missionary, in particular, could train his own men and supervise and carry out such a scheme in his own area.

Other methods will no doubt occur to those who think about the subject. Travelling ophthalmic dispensaries (or travelling ophthalmic doctors) would, I think, be good, especially if the range of each were sufficiently restricted, so that it would have time to remain in each village or group of villages until it had gone a considerable way, at least, towards eradicating the existing infections eye-diseases and given the villages a more or less clean bill of health in this respect before passing on to the next group. Operations could also conveniently be done during such periods. But I think that all promising methods should be tried. Experience would then teach which to reject and which to retain-or what features of each to combine.

The education, improvement and control of midwives, together with the compulsory notification of ophthalmia neonatorum now universally adopted in England, should do much for the reduction of loss of sight from that particular form of eye disease. Indeed the improvement of midwives is a measure which covers far more than the question of prevention of blindness, and is already being attempted in some of the bigger cities of India. I cannot however presume to discuss these questions here. In any case I shall not altogether have wasted your time this afternoon if I have to any extent enabled you to see this problem or induced you to consider it in its manifold bearings. It is a problem which exists all over India and, for that matter, must, we may be sure, exist all over the East and in the more backward countries of the world. We may perhaps hope that the great impulse which the war seems to have given to the humanitarian spirit will not have spent itself when peace comes, and that even greater efforts than heretofore may be directed to the alleviation of such evils as the one I have attempted to describe.

Note on the Census Figures of Blindness in India

The actual figure of totally blind persons for the whole of India given in the Census of 1911 is 443,653. The population by the same Census was 315,156,639. This gives an incidence of 1.4 totally blind persons per thousand of the population. To anyone at all acquainted with the extent of blindness and eye-disease in India these figures appear suspiciously low. Indeed the compilers of the Census reports themselves suspect them. The compiler of the report for the whole of India remarks: "It must be admitted at the outset that the statistics of infirmities are very unreliable." The compilers of the Bombay Presidency census report remark that infirmities are entered in the last column of the schedule, and that the enumerators, already overworked in their official duties, would be apt to let those details slide, or the persons enumerated may have got tired of answering a large number of questions. This remark refers to the acknowledged deficiencies of the 1901 report, but it is no doubt applicable also to 1911.

I have recently made a count of the totally blind actually found in 513 villages of the Nasik district. The total population of these villages, according to the 1911 census, is 212,677, and the number of totally blind persons found is 915. This gives an incidence of 4.38 per thousand of the population. As a certain number of blind persons are bound to have been omitted, the figure of incidence given is below rather than above the true one. It may be objected that the figure of incidence would be lowered if the natural increase in population since 1911 is taken into account. This however is hardly likely to be the case, for in regard to about half the population concerned the count was made after about ten per cent. of the rural inhabitants had been carried off by the influenza epidemic.

It may be worth while to analyse the figures a little more closely. The villages tested are in four talukas and the distribution is as follows :—

			Number of villages tested.	Popula- tion.	Number of totally blind.	Inci- dence per thousand
Malegaon	...	...	127	72,026	381	5.03
Nandgaon	...	...	82	34,482	168	4.87
Baglan...	...	...	131	49,204	216	4.4
Kalwan	...	...	173	56,965	150	2.6

The much lower incidence in the Kalwan taluka is notable and is explained as follows. There is in that taluka a large number of villages inhabited entirely by primitive tribes called Bhils and Konkans. These people lead an open air life in the fields and jungles and live scattered about in isolated huts or small groups of huts and are never found congregated together in large numbers or in anything that could be called more than a very small hamlet. They are mainly quite uneducated and are reckoned among the 'backward' classes. There are 114 of these villages, the word 'village' in this connection denoting merely the territorial division and not a group of houses. The population of these 114 villages is 27,660, and the number of totally blind persons found is 37, and this gives an incidence of only 1.3 per thousand. If these Bhil and Konkani villages are excluded, the incidence for the *rest* of the taluka comes to 3.84. But even in this latter portion of the taluka there is a considerable number of these Bhil and Konkani inhabitants counted in the census along with the more 'advanced'

population, though mostly living separately and leading the same kind of life as their fellows in the exclusively Bhil-Konkani villages. Thus also in that portion of the taluka outside the 114 exclusively Bhil and Konkani villages, the incidence of blindness is lowered by the presence of these people. The same phenomenon is found to some extent in the Baglan taluka which has the next lowest incidence. In that taluka, out of the villages included in the test, there are 22 exclusively Bhil and Konkani villages, with a population of 4565, and totally blind to the number of 5. The incidence is again 1.3. In this taluka, as in Kalwan, there is also outside the exclusively Bhil and Konkani villages a considerable Bhil and Konkani element counted in with the rest of the population, though not to the same extent as in Kalwan. In this way the much lower incidence of blindness in Kalwan and the somewhat lower incidence in Baglan are explained. It is the presence of these 'backward' classes which has *lowered* the average rate for the general population. So far at least, the primitive Bhil justifies his mode of life as against an 'advancement' one of whose features is the crowding into dusty, insanitary towns and villages. It would be interesting to know whether the same relation holds good in regard to other infirmities also.

The census figures give the incidence of total blindness per thousand of the population for the Nasik district as 1.74, whereas we find in this population of 212,677, constituting not quite one fourth of the whole district, an actual incidence of 4.38. And this figure owing to omissions is likely to be below the truth. Further the proportion of the Bhil-Konkani element referred to above is larger for this area than for the rest of the district taken as a whole, so that the area is a favourable one, or in other words likely to be better in regard to blindness than the district as a whole. But the figures taken only as they stand show an incidence $2\frac{1}{2}$ times that of the census rate. The area is of course a small one but if the deficiency of registration holds good to the same extent for the whole of India we may expect to find some million totally blind.

Extracts from the Press

From *The Journal of Tropical Medicine and Hygiene*,
September 1st, 1917.

Mr C G. HENDERSON, of the Indian Civil Service, writing from 62, West Hill, St Leonards-on-Sea, Sussex, England, has published a pamphlet, issued by King Bros. and Potts, Ltd., 66, Norman Road, St Leonards, which although intended for lay readers, it would be well were medical men to pursue, especially for those who do not know India. . . .

The direct remedy for the trouble is no doubt to increase the numbers of medical men capable of dealing with cases of "curable" blindness: but the prevention of the causes of blindness must be the ultimate goal and object of attainment if the greatest good is to be brought about.

There are many excellent ophthalmic surgeons in India there are many admirable clinics and hospitals in the large centres where skilled treatment of the highest value and reliability are attainable, but these are few and far between. In the country districts and the small villages skilled advice is unobtainable, except by long distance journeys over indifferent or bad roads, involving an expense which the poor cannot afford. Now and again a native quack visits the village and contributes to the delay of seeking competent advice, and so to the destruction of sight. Extracts from Mr. Henderson's publication will show what the evil amounts to, and what he seeks to do to alleviate and prevent blindness in India.

Mr. Henderson sets forth the broad lines on which the work might be attempted, which are something as follows:—

(1) Carrying on campaigns against ophthalmia neonatorum in cities, in collaboration with municipal authorities, and attempting to extend this preventive work to villages

and small towns. Even if confined to cities, this work would be one of the greatest importance.

(2) Finding out the blind, and attempting to bring the benefits of modern surgery to them whenever required. In part, at least, this might be done by travelling ophthalmic surgeons, by pecuniary assistance to the poorer sufferers to enable them to attend hospitals, &c.

(3) Keeping in constant touch with sufferers from various kinds of eye complaints and getting them treated through village medical agencies, which would have to be established.

(4) Establishing ophthalmic hospitals and dispensaries, by preference the latter, for it is probable that, for the same expenditure, a number of small institutions would be more effective than a few large ones.

Mr. Henderson's summary of step to be taken is excellent; the difficulty, however, is the enormity of the field of work and the expense involved. To provide ophthalmic surgeons for such a task is well-nigh impossible; for to be a qualified ophthalmic surgeon a man or woman must be a fully qualified doctor. This takes five years of expensive training, and then another two years special study of eye work before the doctor is fit to practise this department of medicine and surgery. The work in India is done by members of the Indian Medical Service and by Indians who have graduated in the medical schools of India. The Indian medical Service men have other duties to attend to, and there ophthalmic work is only a side issue, or something added to their daily task.

Moreover, it must be remembered that the young Indians who take up private practice will seek their fortunes in the cities and large towns, not in the mofussil. The consequence is that the country districts are neglected and blindness runs riot.

The writer would suggest that the system of Health Visitors, as practised in Britain, would present the best method of contending with this great Indian scourge. The

natives in the country districts, and in the towns as well, require to be visited and encouraged (or it may be compelled) to send their children for treatment. Compulsion is a hard term, but it is neither to the benefit of the children nor the State, and least of all to the parents, that ignorant prejudice in a matter of this kind should be permitted. But Indians are no different to people in other countries, who are just as prejudiced against hospitals and doctors in many instances as are Indians, and the moment they are persuaded of the advantages offered them, and especially the saving of sight, they will willingly, if encouraged, fall in with the wiser and saner counsels of those who know best.

Mr. Henderson should address the "Humanitarian Corps" at the College of Ambulance, 3, Vere Street London, W. 1, for assistance in his scheme.

SIR JAMES CANTLIE, M.B., F.R.C.S.

From *The Medical Press*, January 9th, 1918.

The appearance of a pamphlet entitled "Blindness in India, and the possibilities of its diminution" calls for serious consideration. The writer is an Indian Civil Servant, in charge of a large district. He makes no claim to medical knowledge, but shows that he possesses not a little acquaintance with his subject. Indeed, one finds it difficult to realise that this brochure has been written, as it undoubtedly has, by a layman.

Mr. Henderson has grasped the heart of his problem; he states his facts clearly and simply, and his deductions have been accurately drawn. He starts with the statement: "There are six hundred thousand blind persons in India. This figure relates to the *totally* blind." Let the reader pause for a moment to think what this really means, and he must, indeed, have little imagination if the figures leave him untouched. Mr. Henderson, the head of a large district of a million people, has gone in and out among all classes,

has made it his business to find out the distressing facts in connection with loss of sight in India.

Looking at the questions he raises, first from the scientific point of view, the ophthalmic surgeon cannot fail to be struck with the insight he displays. Every paragraph of the pamphlet is full of incisive meaning, and nearly every statement might have emanated from the pen of an ophthalmic surgeon. The contrast he draws between preventable and curable diseases, and the suggestions he makes on the subject of each class, are worthy of close attention. His understanding of the submerged mass of cataract material, spread throughout the villages of India, is as surprising as his proposals for a remedy are practical.

The broad lines on which he proposes to work are as follows :—

(1) The institution of widespread campaigns against ophthalmia neonatorum in cities; these would be undertaken in collaboration with the local authorities and would, in time, overflow from the cities to the country side.

(2) A systematic search for the hidden blind, combined with an attempt either to take them to surgical centres, or, better still, to bring travelling surgical aid to them

(3) A large extension of the present system of ophthalmic medical aid to the small towns and villages of India.

It is difficult for anyone who has not had first hand experience of medical practice in the East to realise the state of things out there. Granular ophthalmia claims its victims by the ten thousand, whereas it really is a disease which, when properly treated at an early stage, should not cause the loss of a single eye. The neglect of the eyes of patients suffering from small-pox and other febrile conditions leads to a vast amount of blindness, whilst the treatment of mild ocular affections by irritant drugs is probably one of the most powerful of the evil factors that spread blindness broadcast through the land. Large numbers of men and women suffering from glaucoma, from cataract, and

from many other curable diseases, are allowed to hide in their villages like wounded animals, waiting only for their release by death. This is not an overdrawn picture. It is a statement of cold, hard, cruel facts, well-known to anyone and everyone who has practised or is practising medicine in the East.

Turning from this aspect of the case to the great social and economic problems involved, the questions that will spring up in the minds of many readers will naturally be: Why has this appalling waste of the economic power of a great Dependency been so long permitted? Whose fault is it that the problem of blindness in India has so long been allowed to slide? Is it possible that it is no one's fault, that the difficulties of grappling with preventable and curable blindness are too great to be handled? Either something can be done, or it cannot. If it can, is it not the duty of the State to do it? Why should it be left to private enterprise?"

LT.-COL R. H. ELLIOT, M D., F.R.C S., Late Professor of Ophthalmology, Medical College, Madras,

From *The Medical Times*, November 24th, 1917.

ONLY those who reside or have resided in India can have any real knowledge of the widespread prevalence of blindness there. The number of blind people in India far exceeds that in this country. A recent estimate is that there are 34,000 blind persons in the United Kingdom, one third being in the workhouses. Of that number it has been proved that 10 per cent. would never have been blind had they been looked after with real care in infancy.

We understand that an effort is to be made to deal with this very pressing problem in this country. Mr. Hayes Fisher, President of the Local Government Board, is reported to have stated recently that it is the intention of the Local Government Board not only to help blindness but to stamp it out.

But what about India? There has just reached us a pamphlet entitled, "Blindness in India and the possibilities of its diminution," by Mr. C G Henderson, of the Indian Civil Service (Messrs. King Bros & Potts, Ltd., 66, Norman Road, St. Leonards-on-Sea, England). This gentleman has evidently made a careful study of the question and writes from first hand knowledge.

His recommendations seem to us reasonable and quite within practical politics. Probably in the early educative work which will be necessary to ensure later the smooth and effective working of a practical scheme a system of Health Visitors similar to that in vogue in Britain would be an important item in this campaign. We understand that Dr James Cantlie, writing in "The Journal of Tropical Medicine and Hygiene," has made this suggestion, and we cordially endorse this view. We hope that efforts will be made to increase the facilities for medical help. There should be more ophthalmic surgeons and we think that native Indian doctors especially should be trained in ophthalmic work. If skilled operators, they would soon command the confidence of a certain class of the population of India and might do much to alleviate or cure the blind. We wish that Mr. Henderson could enlist the sympathies of our Government. India has done much for the Empire, and it would not be too much for the British Government to accord official sanction to any scheme intended to check or ameliorate blindness in India and, if necessary, to make a grant in money for this purpose.

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